

CLAIMS

What is claimed is:

1 ^{Sub} 1. A compressed data structure, comprising:
2 ^{B17} a plurality of code strings; and
3 a plurality of look-up strings each containing an index identifying a
4 particular code string to be retrieved and an instruction identifying an operation
5 to be performed on the retrieved code string.

1 2. The data structure of Claim 1, wherein at least some of the code
2 strings are positioned in a library and the index of at least one look-up string
3 identifies a position in the library from which a particular code string is to be
4 retrieved.

1 3. The data structure of Claim 2, wherein the library comprises a
2 segmented library, each segment of the library containing at least one code
3 string.

1 4. The data structure of Claim 1, wherein at least some of the code
2 strings are positioned in a history cache and the index of at least one look-up
3 string identifies a position in the history cache from which a particular code
4 string is to be retrieved.

1 5. The data structure of Claim 1, wherein the instruction in a look-up
2 string comprises an instruction to retrieve the code string identified by the index
3 in the look-up string and to write that code string to an output memory.

1 6. The data structure of Claim 1, wherein the instruction in a look-up
2 string comprises an instruction to retrieve the code string identified by the index
3 in the look-up string, alter that code string, and write the altered code string to
4 an output memory.

1 7. A data processing system, comprising:
2 a plurality of code strings;
3 a plurality of look-up strings each containing an index identifying a
4 particular code string and an instruction identifying an operation to be performed
5 on the identified code string; and
6 a decompression engine operable, for at least one look-up string, to
7 retrieve a code string identified by the index in the look-up string and to perform
8 an operation on or using the retrieved code string according to the instruction in
9 the look-up string.

1 8. The system of Claim 7, wherein at least some of the code strings
2 are positioned in a library and the index of at least one look-up string identifies a
3 position in the library from which a particular code string is to be retrieved.

1 9. The system of Claim 8, wherein the library comprises a segmented
2 library, each segment of the library containing at least one code string and the
3 instruction in a look-up references the library segment containing the code string
4 identified by the instruction in the look-up string.

1 10. The system of Claim 8, further comprising an output memory and
2 wherein the decompression engine is operable to at least perform the functions
3 of:
4 writing the retrieved code string to the output memory; and
5 altering the retrieved code string according to the instruction in the look-
6 up string and writing the altered code string to the output memory.

1 11. The system of Claim 9, further comprising a history cache and
2 wherein the decompression engine is further operable to:
3 write to a position in the history cache a code string recently written to
4 the output memory; and
5 to retrieve a code string from a position in the history cache identified by
6 the index in a look-up string, the instruction to retrieve from the history cache
7 being provided by the instruction in the look-up string.

1 12. The system of Claim 11, wherein the decompression engine is
2 further operable to repeatedly write the code string retrieved from the history
3 cache a selected number of times, the selected number being identified by the
4 look-up string.

1 13. The system of Claim 11, wherein the decompression engine is
2 further operable to alter the code string retrieved from the history cache and
3 write the altered code string to the output memory, the code string being altered
4 according to the instruction of the look-up string.

1 14. The system of Claim 7, wherein the code string each comprise
2 thirty-two bits.

1 15. The system of Claim 14, wherein at least some of the look-up
2 string includes no more than eight bits.

1 16. A computing system, comprising:
2 a first memory location;
3 a plurality of code strings stored in the first memory location;
4 a plurality of look-up strings stored in the first memory location, each
5 look-up string containing an index identifying a particular code string to be
6 retrieved and an instruction identifying an operation to be performed on the
7 retrieved code string;
8 a second memory location;
9 a decompression program operating from the second memory location,
10 the decompression program comprising machine readable instructions that when
11 executed causes a processor, for at least one look-up string, to retrieve the code
12 string contained in the indexed position identified by the index of the look-up
13 string and to perform an operation on or using the retrieved code string
14 according to the instruction of the look-up string; and
15 a processor in operative communication with the first and second memory
16 locations, the processor operative to execute the decompression program.

1 17. The system of Claim 16, wherein at least some of the code strings
2 are positioned in a library and the index of at least one look-up string identifies a
3 position in the library from which a particular code string is to be retrieved.

1 18. The system of Claim 17, further comprising a processor cache
2 directly accessible by the processor and wherein the processor is further
3 operable to load into and access from the processor cache at least portions of
4 the library and decompression program.

1 19. The system of Claim 17, wherein the library comprises a
2 segmented library, each segment of the library containing at least one code
3 string and the instruction in a look-up string references the library segment
4 containing the code string identified by the index in the look-up string.

1 20. The system of Claim 17, further comprising an output memory
2 location and wherein the decompression program contains further machine
3 readable instructions for:

4 writing a retrieved code string to the output memory; and
5 altering a retrieved code string according to the instruction in the look-up
6 string and writing the altered code string to the output memory.

1 21. The system of Claim 18, further comprising a history cache
2 accessible by the processor, and wherein the decompression program comprises
3 further machine readable instructions for:

4 writing to a position in the history cache a code string recently written to
5 the output memory; and

6 retrieving a code string from a position in the history cache identified by
7 the index in the look-up string, the instruction to retrieve from the history cache
8 being provided by the instruction in the look-up string.

1 22. The system of Claim 21, wherein the decompression program
2 comprises further machine readable instructions to repeatedly write the code

3 string retrieved from the history cache a selected number of times, the selected
4 number being identified by the look-up string.

1 23. The system of Claim 21, wherein the decompression program
2 comprises further machine readable instructions for altering the code string
3 retrieved from the history cache according to the instruction in the look-up string
4 and writing the altered code string to the output memory.

1 24. The system of Claim 20, wherein the output memory location and
2 the second memory location are the same.

1 25. The system of Claim 24, wherein the output and second memory
2 locations comprise volatile memory.

1 26. The system of Claim 16, wherein the first memory location
2 comprises non-volatile memory, and the second memory location comprises
3 volatile memory.

1 27. A method for decompressing a data structure having a plurality of
2 look-up strings and a plurality of code strings, the method comprising:
3 reading a look-up string;
4 retrieving a code string identified by the look-up string; and
5 performing on the retrieved code string an operation identified by the
6 look-up string.

1 28. The method of Claim 27 wherein at least some of the code strings
2 are positioned in a library and the act of retrieving comprises retrieving a code
3 string from a position in the library identified by the look-up string.

1 29. The method of Claim 27, wherein the act of performing comprises
2 writing the retrieved code string to an output memory.

1 30. The method of Claim 27, wherein the act of performing comprises
2 altering the retrieved code-string by one bit and writing the altered code string to
3 an output memory.

1 31. The method of Claim 27, wherein the act of performing comprises
2 altering the retrieved code string by two or more bits and writing the altered
3 code string to an output memory.

1 32. The method of Claim 27, wherein:
2 a look-up string includes an identifier and an arithmetic string, the
3 identifier being used to identify a code string to be retrieved; and
4 the act of performing comprises altering the retrieved code string by
5 performing a mathematical operation on the retrieved code string with the
6 arithmetic string and writing the altered code string to an output memory.

1 33. The method of Claim 27, wherein:
2 a look-up string includes an identifier and a replacement, the identifier
3 being used to identify a code string to be retrieved; and
4 the act of performing comprises altering the retrieved code string by
5 replacing a selected number of bits in the retrieved code string with the
6 replacement and writing the altered code string to an output memory.

1 34. The method of Claim 27, further comprising:
2 writing to a position in a history cache one or more code strings recently
3 written to an output memory;
4 retrieving a code string from a position in the history cache, the position
5 identified by a look-up string; and
6 performing on the code string retrieved from the history cache an
7 operation identified by the look-up string.

1 35. The method of Claim 34, wherein the act of performing an
2 operation on the code string retrieved from the history cache comprises writing
3 that code string to the output memory.

1 36. The method of Claim 34, wherein the act of performing an
2 operation on the code string retrieved from the history cache comprises writing
3 that code string to the output memory a specified number of times, the number
4 being specified by the look-up string.

1 37. The method of Claim 34, wherein the act of performing an
2 operation on the code string retrieved from the history cache comprises altering
3 the retrieved code string by one bit and writing the altered code string to an
4 output memory.

1 38. The method of Claim 34, wherein the act of performing an
2 operation on the code string retrieved from the history cache comprises altering
3 the retrieved code string by two or more bits and writing the altered code string
4 to an output memory.

1 39. The method of Claim 34, wherein:
2 a look-up string includes an identifier and an arithmetic string, the
3 identifier being used to identify a code string to be retrieved; and
4 the act of performing an operation on the code string retrieved from the
5 history cache comprises altering the retrieved code string by performing a
6 mathematical operation on the retrieved code string with the arithmetic string
7 and writing the altered code string to an output memory.

1 40. The method of Claim 34, wherein:
2 a look-up string includes an identifier and a replacement, the identifier
3 being used to identify a code string to be retrieved; and
4 the act of performing an operation on the code string retrieved from the
5 history cache comprises altering the retrieved code string by replacing a selected
6 number of bits in the retrieved code string with the replacement and writing the
7 altered code string to an output memory.

1 41. A computer program product for decompressing a data structure,
2 the data structure containing a plurality of code strings and a plurality of look-up
3 strings, the product comprising a machine useable medium having machine
4 readable instructions thereon for:

5 reading the look-up strings;

6 for each look-up string read, retrieving a code string identified by the look-
7 up string and performing on the retrieved code string an operation identified by
8 that look-up string.

1 42. The product of Claim 41, wherein the instructions for performing
2 comprise instructions for writing the retrieved code string to an output memory.

1 43. The product of Claim 41, wherein the instructions of performing
2 comprise instructions for altering the retrieved code string by one bit and writing
3 the altered code string to an output memory.

1 44. The product of Claim 41, wherein the instructions for performing
2 comprise instructions for altering the retrieved code string by two or more bits
3 and writing the altered code string to an output memory.

1 45. The product of Claim 41, wherein:
2 the index of the look-up string comprises an identifier and a arithmetic
3 string, the identifier being used to identify a codes string to be retrieved; and
4 the instructions for performing comprises instruction for altering the
5 retrieved code string by performing a mathematical operation on the retrieved
6 code string with the arithmetic string and writing the altered code string to an
7 output memory.

1 46. The product of Claim 41, wherein:
2 the index of the look-up string comprises an identifier and a replacement,
3 the identifier being used to identify a codes string to be retrieved; and

4 the instructions for performing comprise instructions altering the retrieved
5 code string by replacing a selected number of bits in the retrieved code string
6 with the replacement and writing the altered code string to an output memory.

1 47. The product of Claim 41, further comprising instructions for:
2 writing to a history cache one or more code strings recently written to an
3 output memory;
4 retrieving a code string from a position in the history cache, the position
5 identified by the look-up string; and
6 performing on the code string retrieved from the history cache an
7 operation identified by the look-up string.

1 48. The product of Claim 47, wherein the instructions for performing
2 an operation on the code string retrieved from the history cache comprise
3 instructions for writing that code string to the output memory.

1 49. The product of Claim 47, wherein the instructions for performing
2 an operation on the code string retrieved from the history cache comprise
3 instructions for writing that code string to the output memory a specified
4 number of times, the number being specified by the look-up string.

1 50. The product method of Claim 47, wherein the instructions for
2 performing an operation on the code string retrieved from the history cache
3 comprise instructions for altering the retrieved code string by one bit and writing
4 the altered code string to the output memory.

1 51. The product of Claim 47, wherein the instructions for performing
2 an operation on the code string retrieved from the history cache comprise
3 instructions for altering the retrieved code string by two or more bits and writing
4 the altered code string to the output memory.

